

We claim:

1. A runflat insert for enabling a vehicle to run on a deflated tire, mounted in an assembly comprising a pneumatic tire and a wheel rim, said insert being mounted inside the air cavity of the tire and secured to the wheel rim, said insert comprising:

a) an elastomeric outer contacting portion for contacting the interior surface of the tire during deflated operation of the tire,

b) a reinforced annular band disposed radially inward of said outer contacting portion, wherein said band comprises an elastomeric shear layer, at least a first membrane adhered to the radially inward extent of said elastomeric shear layer and at least a second membrane adhered to the radially outward extent of said elastomeric shear layer,

c) at least one sidewall portion extending radially inward from said contacting portion for connecting said annular band to a base member fitted around the wheel rim for securing said insert to the rim, and

d) at least one carcass layer adhered to said annular band, and said carcass layer extending radially inward from said annular band and anchored in said base member,

wherein the shear layer comprises an elastomeric composition having a metal salt of a carboxylic acid, and wherein the carboxylic acid is selected from the group consisting of unsaturated carboxylic acids.

2. The runflat insert of claim 1 wherein a ratio of the longitudinal tensile modulus of each of said membranes to the shear modulus of said shear layer is at least 100:1.

3. The runflat insert of claim 1, wherein said elastomeric shear layer has a thickness between about 4 mm and about 20 mm.

4. The runflat insert of claim 1, wherein said elastomeric shear layer has a shear modulus of elasticity of between about 3 MPa and about 20 MPa.

5. The runflat insert of claim 1, wherein said elastomeric shear layer has a shear modulus of elasticity of about 3 MPa to about 10 MPa.
6. The runflat insert of claim 1, wherein said elastomeric shear layer has a shear modulus of elasticity of about 3 MPa to about 7 MPa.
7. The runflat insert of claim 1, wherein said elastomeric shear layer has a tangent delta of less than or equal to about 0.1.
8. The runflat insert of claim 1, wherein the product of the shear modulus of elasticity of said shear layer times the radial thickness of said shear layer divided by the radius of the outermost extent of said second membrane is between about 2 bar and about 6 bar.
9. The runflat insert of claim 1, wherein the product of the shear modulus of elasticity of said shear layer times the radial thickness of said shear layer divided by the radius of the outermost extent of said second membrane is about 3 bar.
10. A wheel assembly comprising a pneumatic tire and the runflat insert of claim 1.
11. The runflat insert of claim 1 wherein the elastomeric composition is selected from the group consisting of natural and synthetic elastomers, and mixtures thereof.
12. The runflat insert of claim 1 wherein the elastomeric composition of the shear layer is selected from the group consisting of dienic elastomers.
13. The runflat insert of claim 12 wherein the dienic elastomer is selected from the group consisting of polybutadienes, polyisoprenes, butadiene copolymers, isoprene copolymers and mixtures thereof.

14. The runflat insert of claim 1 wherein the elastomeric composition of the shear layer is selected from the group consisting of natural rubber, synthetic polyisoprenes, styrene-butadiene copolymers, butadiene-isoprene copolymers, isoprene-butadiene-styrene copolymers, and mixtures thereof.
- 5 15. The runflat insert of claim 12 wherein the dienic elastomer is selected from the group consisting of natural rubber, synthetic cis-1,4 polyisoprenes, and mixtures thereof.
- 10 16. The runflat insert of claim 1 wherein the carboxylic acid is selected from the group consisting of unsaturated carboxylic acids.
17. The runflat insert of claim 1 wherein the carboxylic acids are selected from the group consisting of methacrylic acid, ethacrylic acid, acrylic acid, cinnamic acid, crotonic acid, maleic acid, fumaric acid, itaconic acid, and mixtures thereof.
- 15 18. The runflat insert of claim 1 wherein the metal of the metal salt is selected from the group consisting of sodium, potassium, iron, magnesium, calcium, zinc, barium, aluminum, tin, zirconium, lithium, cadmium, cobalt and mixtures thereof.
- 20 19. The runflat insert of claim 1 wherein the metal salt is selected from the group consisting of zinc diacrylate and zinc dimethacrylate.
- 25 20. The runflat insert of claim 1 wherein the elastomeric composition of the shear layer further includes a curing agent comprising a composition producing free radicals.
- 30 21. The runflat insert of claim 20 wherein the curing agent is selected from the group consisting of peroxides, azo compounds, disulfides, and tetrazenes.
22. The runflat insert of claim 21 wherein the curing agent is a peroxide.

23. The runflat insert of claim 22 wherein the peroxide is selected from the group consisting of di-cumyl peroxide; tert-butyl cumyl peroxide; 2,5-dimethyl-2,5 BIS (tert-butyl peroxy)hexyne-3; BIS(tert-butyl peroxy isopropyl)benzene; 4,4-di-tert-butyl peroxy N-butyl valerate; 1,1-di-tert-butylperoxy-3,3,5-trimethylcyclohexane; bis-(tert-butyl peroxy)-diisopropyl benzene; t-butyl perbenzoate; di-tert-butyl peroxide; 2,5-dimethyl-2,5-di-tert-butylperoxide hexane and mixtures thereof.
24. The runflat insert of claim 1 wherein the shear layer comprises:
- (a) for 100 phr elastomer;
 - (b) approximately 10 to 60 phr metal salt of carboxylic acid;
 - (c) approximately 30 to 70 phr filler; and
 - (d) approximately 0.5 to 2 phr peroxide.
25. The runflat insert of claim 1 wherein the shear layer comprises:
- (a) for 100 phr natural rubber;
 - (b) approximately 15-40 phr selected from the group consisting of zinc diacrylate and zinc dimethacrylate;
 - (c) approximately 30-60 phr filler; and
 - (d) approximately 0.5 to 2 phr peroxide.

26. The runflat insert of claim 1 wherein the shear layer comprises:
- (a) for 30-65 phr natural rubber;
 - (b) approximately 35-70 phr polybutadiene;
 - (c) approximately 10-20 phr selected from the group consisting of zinc diacrylate and zinc dimethacrylate;
 - (d) approximately 30-60 phr carbon black; and
 - (e) approximately 0.5 to 2 phr peroxide.
27. The runflat insert of claim 1 wherein the shear layer comprises:
- (a) for 80-100 phr natural rubber;
 - (b) approximately 0-20 phr polybutadiene;
 - (c) approximately 20-50 phr selected from the group consisting of zinc diacrylate and zinc dimethacrylate;
 - (d) approximately 40-70 phr silica; and
 - (e) approximately 0.5 to 2 phr peroxide.
28. The runflat insert of claim 1 wherein the shear layer comprises:
- (a) for 50-90 phr natural rubber;
 - (b) approximately 10-50 phr polybutadiene;
 - (c) approximately 20-40 phr selected from the group consisting of zinc diacrylate and zinc dimethacrylate;
 - (d) approximately 30-60 phr carbon black; and
 - (e) approximately 0.5 to 2 phr peroxide.
29. The runflat insert of claim 1 wherein the shear layer comprises:
- (a) for 80-100 phr natural rubber;
 - (b) approximately 0-20 phr polybutadiene;
 - (c) approximately 30-50 phr selected from the group consisting of zinc diacrylate and zinc dimethacrylate;
 - (d) approximately 30-70 phr silica; and
 - (e) approximately 0.5 to 2 phr peroxide.